

Appendix B – Pending Claims

Application No. 09/629,352

1. A monitoring system for a luminaire, comprising:
a sensing unit attached to the luminaire so that the sensing unit can measure the electrical operating characteristics of the luminaire;
a control unit operatively coupled to the sensing unit to receive measurements from the sensing unit;
a monitor operatively coupled to the control unit to display an indication of the operative status of the luminaire.
2. The monitoring system of Claim 1 wherein the electrical operating characteristics include the current and voltage at each of the input and the output;
3. The monitoring system of claim 1, further comprising:
a transmitter coupled to the control unit for transmitting data indicative of a functional status of the luminaire;
a receiver coupled to the monitor for receiving the data transmitted from the control unit through the transmitter so that the monitor can display the indication of the operative status of the luminaire.
4. The monitoring system of claim 1 wherein the monitor is operatively coupled to the Internet so that remote access is provided to the monitor.
5. The monitoring system of claim 1 wherein the control unit acts to control an associated system, that is associated with the luminaire, when the control unit determines that the luminaire is inoperative.
6. The monitoring system of claim 5 wherein the associated system is a traffic signal.

7. The monitoring system of claim 5 wherein the associated system is a street light.
8. The monitoring system of claim 5 wherein the associated system is an automatic teller machine.
9. A luminaire monitoring system, comprising:
 - a current sensor operatively coupled to the luminaire for detecting electrical current flowing through the luminaire and producing a current signal indicative of any detected electrical current;
 - a voltage sensor operatively coupled to the luminaire for detecting the presence of an electrical voltage at a predetermined location of the luminaire and producing a voltage signal indicative of any detected electrical voltage;
 - a controller attached to the voltage sensor and the current sensor so as to receive the current signal and the voltage signal, and determine the operational status of the luminaire and produce a control signal indicative of the operational status; and
 - monitoring equipment coupled to the controller for receiving control signal and providing an indication of any unexpected operational status.
10. The monitoring system of claim 9 wherein the unexpected operational status is a power failure.
11. The monitoring system of claim 9 wherein the unexpected operational status is a luminaire filament failure.
12. The monitoring system of claim 9 wherein the current sensor is capable of measuring the current at the input and the output of the luminaire.
13. The monitoring system of claim 9 wherein the predetermined location is at the input of the luminaire.
14. The monitoring system of claim 13 wherein the voltage sensor is further capable of monitoring the voltage at the output of the luminaire.

15. The monitoring system of claim 9 wherein the monitoring equipment is coupled to the controller via a transmitter operatively connected to the controller and a receiver operatively connected to the monitoring equipment.

16. The monitoring system of claim 9 wherein the monitoring device provides a display capable of communicating to maintenance personnel the existence of problems with the luminaire.

17. The monitoring system of claim 9 wherein the monitoring equipment and the controller are operatively connected to one another via a first transceiver attached to the monitoring equipment and a second transceiver attached to the controller.

18. The monitoring system of claim 9 wherein the monitoring equipment and the controller are directly connected via a communication bus.

19. The monitoring device of claim 9 wherein the control signal is also provided to a related system, the related system including the luminaire.

20. The monitoring device of claim 19 wherein the control signal includes information to alter the operation of the related system.

21. A monitoring system for monitoring the operational condition of a luminaire, the system comprising:

sensing means operatively coupled to the luminaire for determining the electrical operating characteristics of the luminaire including current flow and voltage levels at predetermined locations of the luminaire;

control means attached to the sensing means for requesting information regarding the electrical operating characteristics of the luminaire and receiving signals from the sensing means indicative of the sensed operational characteristics, said control means for further determining operating status of the luminaire based on the electrical operational characteristic;

monitoring means coupled to the control means for communicating the operating status of the luminaire.

22. The system of claim 21 wherein the sensing means includes a current sensor for monitoring the current flow into an input of the luminaire.

23. The system of claim 21 wherein the sensing means includes a voltage sensor for determining the voltage level at an input to the luminaire.

24. The system of claim 23 wherein the predetermined locations are at the input of the luminaire and the output of the luminaire.

25. The system of claim 21 wherein the monitoring means is coupled to the control means via a transmitter operatively connected to the control means and a receiver operatively connected to the monitoring means.

26. The system of claim 21 wherein the monitoring means and the control means are operatively connected to one another via a first transceiver attached to the monitoring equipment and a second transceiver attached to the controller.

27. The system of claim 21 wherein the monitoring device provides a display capable of communicating to maintenance personnel the existence of problems with the luminaire.

28. The system of claim 21 wherein the monitoring means is a display for providing a visual indication regarding the operational status of the plurality of luminaires.

29. The system of claim 21 wherein the monitoring means is a master controller coupled to a related device for providing control signals which will effect the operation of the related device based on the condition of at least one of the plurality of luminaires.

30. The system of claim 29 wherein the related device is an automated teller machine.

31. The system of claim 29 wherein the luminaire is one component of a traffic light and the related device is a traffic light controlling system for controlling the operation of the traffic light.

32. The system of claim 31 wherein the monitoring means will alter the operation of the traffic light controlling system if the control unit indicates a failure with one of the traffic lights.

33. The system of claim 32 wherein the altered operation of the traffic light control will cause selected operational traffic lights to flash.

34. The system of claim 30 wherein the monitoring means will deactivate the automated teller machine when one of the plurality of luminaires are found to be inoperative.

35. A monitoring system for monitoring the operation of a plurality of luminaires, comprising:

a plurality of sensing units, each sensing unit coupled to a luminaire and comprising:

a current sensor for sensing the current at an input to the luminaire and at an output to the luminaire, the current sensor for further producing a current signal indicative of the sensed current; and

a voltage sensor for sensing the voltage at an input to the luminaire and at an output to the luminaire, the voltage sensor for further producing a voltage signal indicative of the sensed voltage;

a control unit coupled to the plurality of sensing units for receiving the plurality of voltage signals and the plurality of current signals, the control unit further capable of determining the operational status of each of the plurality of luminaires based on the received plurality of voltage signals and the received plurality of current signals, the control unit capable of producing a status output indicative of the operational status of each luminaire; and

a monitoring unit coupled to the control unit to receive the status output and provide an indication of the operational status.

36. The system of claim 35 wherein the monitoring unit is a display for providing a visual indication regarding the operational status of the plurality of luminaires.

37. The system of claim 35 wherein the monitoring unit is a master controller coupled to a related device for providing control signals which will effect the operation of the related device based on the condition of at least one of the plurality of luminaires.

38. The system of claim 37 wherein the related device is an automated teller machine.

39. The system of claim 37 wherein the plurality of luminaires are traffic lights and the related device is a traffic light controlling system for controlling the operation of the traffic lights.

40. The system of claim 39 wherein the monitoring device of will disable the traffic lights if the control unit indicates a failure with one of the traffic lights.

41. The system of claim 38 wherein the monitoring device will deactivate the automated teller machine when one of the plurality of luminaires are found to be inoperative.

42. The system of claim 35 wherein the monitoring unit is coupled to the control unit via a transmitter operatively connected to the control unit and a receiver operatively connected to the monitoring unit.

43. The system of claim 42 wherein the transmitter and the receiver are both transceivers capable to two way communication.